

Gary C. Johnson - Appn. # 10 / 021,656

I Claim;

7. A new self controlled, self contained, gear driven differential, having continuous drive means for each output shaft, said differential comprising a common planetary differential gear, and at least one new planetary differential gear, said new differential including :

a differential gear housing (8) that is drivable rotatively, and planet gears (13,14) mounted in the said housing (8) for axial and radial rotation therewith, and differential side bevel gears (11,12), mounted rotatively in the said housing (8), meshing with the said planet gears (13,14), and one axle shaft (5); being axially stationary to the side bevel gear (12), said axle shaft (5); being freely rotative within the said differential housing (8), and further comprising :

at least one said new planetary differential gear comprising :

two sun gears (6,7), and at least one planet gear (15,16), and a support structure (9), and one input shaft (19), and two output shafts (5,10);

wherein :

- (a) said support structure (9), is independently rotative of any other housing of the said differential; and the said support structure supporting the said at least one planet gear (15/16), the support structure (9); being axially stationary to the side bevel gear (11), the said support structure (9); being axially supported by way of the differential case (8), and
- (b) one input shaft (19); being axially stationary to the drive case (8), the said input shaft (19); having a smooth rounded inner surface throughout, and
- (c) a first sun gear (7); being open throughout it's central axis, the said first sun gear (7); being axially stationary to the end of the said input shaft (19), and

- (d) a first output shaft (5); being entered freely through and past the end of the said input shaft (19), and past the said first sun gear (7); herein the end of the said first output shaft (5); protrudes past the said first sun gear (7); being entered into the support structure (9), and
  - (e) a second output shaft (10); being freely entered through the case (8); wherein the said second output shaft (10); is axially stationary to the said the said support structure (9), and
  - (f) a second sun gear (6); being axially stationary to the end of the said first output shaft (5), and
  - (g) a shaft /shafts (17/18); being off-centered, and stationary in the support structure (9); along the central axis of the differential, and
  - (h) at least one planet gear (15/16); orbitally engaged to the said first and second sun gear (6, and 7), the said at least one planet gear (15/16); being rotatively stationary in the support structure (9); by way of the said shaft /shafts (17/18).
8. A new planetary differential gear as claimed in claim 7., the said at least one new planetary differential gear including:
- (a) said support structure (9), is independently rotative of any other housing of the said differential; and the said support structure supporting the said at least one planet gear (15/16), the support structure (9); being axially stationary to the side bevel gear (11), the said support structure (9); being axially supported by way of the differential case (8), and
  - (b) one input shaft (19); being axially stationary to the drive case (8), the said input shaft (19); having a smooth rounded inner surface throughout, and
  - (c) a first sun gear (7); being open throughout it's central axis, the said first sun gear (7); being axially stationary to the end of the said input shaft (19), and

- (d) a first output shaft (5); being entered freely through and past the end of the said input shaft (19), and past the said first sun gear (7); herein the end of the said first output shaft (5); protrudes past the said first sun gear (7); being entered into the support structure (9), and
- (e) a second output shaft (10); being freely entered through the case (8); wherein the said second output shaft (10); is axially stationary to the said the said support structure (9), and
- (f) a second sun gear (6); being axially stationary to the end of the said first output shaft (5), and
- (g) a shaft /shafts (17/18); being off-centered ,and stationary in the support structure (9); along the central axis of the differential, and
- (h) at least one planet gear (15/16); orbitally engaged to the said first and, second sun gear (6,and 7), the said at least one planet gear (15/16); being rotatively stationary in the support structure (9); by way of the said shaft /shafts (17/18).

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